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Notes:
1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

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Dictionary: Last updated 10/08/2008 / Priority: 1. Information communication technology (ICT) / 2. Electronic engineering / 3. Technical term

## FULL CONTENTS

[Claim(s)]

[Claim 1] It corresponds to the application process of the window it was [ the window ] open on the display screen. In document processing system equipment equipped with the window manager function which distinguishes a keyboard or the alter operation from a mouse directly above the cursor location on the display screen, and notifies the alter operation event to the application process of relevance It is the number generator which is generated one by one and supplies the character string of a number to each application process. The number generating section which makes serial generate the character string of a number using the data of a counter, the given sequence-of-numbers generating rule, and a sequence-of-numbers generating parameter, The alter operation signal generation section which changes the contents of the operation processing which inputs the character string of the generated number into a directions position into the signal sequence of a series of alter operation including the bottom of a key press, and mouse operation, Change into the signal sequence of a series of alter operation the character string of the number generated in said number generating section according to numbering directions by the alter operation signal generation section, and as an alter operation event The number generator characterized by having the control section notified to the application process of a processing object through said window manager function.

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[Detailed Description of the Invention]

[0001]

[Industrial Application] Especially this invention corresponds to the application process of the window it was [ the window ] open on the display screen about a number generator. In document processing system equipment equipped with the window manager function which distinguishes a keyboard or the alter operation from a mouse directly above the cursor location on the display screen, and notifies the alter operation event to the application process of relevance To each application process, it generates one by one, the character string of a number is supplied, and it is related with the number generator which can do efficiently the numbering work in the number of an itemized statement, the text editing of numerical order, etc.

[0002]

[Description of the Prior Art] When working numbering, such as an itemized statement, in document processing system equipment conventionally, a number is inputted manually one by one, or a special control sign is inputted instead of a number, and the method of transposing a control sign to a suitable number and printing it with a formatter, is taken. Moreover, about automation of numbering work, a number generator is built into document processing system equipment, and there is a proposal of "the number generating method of document processing system equipment" constituted so that specific operation could generate consecutive numbers in a document.

[0003] In "the number generating method of document processing system equipment" given in JP,H4-118774,A The number generation processing section which becomes document processing system equipment from an input data control section, the sequence-of-numbers generating section, and a display-position definition part is prepared. When this number generation processing section is started, after distinguishing input data and transmitting data to the sequence-of-numbers generating section and a display-position definition part, while generating a sequence of numbers, a display position is determined and the position on the determined display screen is made to generate a number using the generated sequence of numbers.

[0004]

[Problem to be solved by the invention] However, since it has the display-position definition part which is strongly dependent on the number generation processing section in the composition of the document processing system equipment by such a number generating method, The number generation processing section becomes indivisible from the document processing system equipment, and when starting and using a document processing system equipment process in an application process, it must prepare the number generation processing section for every document processing system equipment process. Moreover, since it is constituted so that two or more numbers may be collectively generated using the sequence-of-numbers generating section, there is a problem of being rather inconvenient in reattaching a number here.

[0005] Are made in order that this invention may solve the above problems, and [ the purpose of this invention ] It corresponds to the application process of the window it was [ the window ] open on the display screen. In document processing system equipment equipped with the window manager function which distinguishes a keyboard or the alter operation from a mouse directly above the cursor location on the display screen, and notifies the alter operation event to the application process of relevance To each application process, it generates one by one, the character string of a number is supplied, and it is in offering the number generator which can do efficiently the numbering work in the number of an itemized statement, the text editing of numerical order, etc.

[0006]

[Means for solving problem] In order to attain the above purposes, [ the number generator of this invention ] It corresponds to the application process of the window it was [ the window ] open on the display screen. In document processing system equipment equipped with the window manager function (1) which distinguishes a keyboard or the alter operation from a mouse directly above the cursor location on the display screen, and notifies the alter operation event to the application process of relevance It is the number generator which is generated one by one and supplies the character string of a number to each application process (2). The number generating section (3) which makes serial generate the character string of a number using the data of a counter, the given sequence-of-numbers generating rule, and a sequence-of-numbers generating parameter, The alter operation signal generation section (4) which changes the contents of the operation processing which inputs the character string of the generated number into a directions position into the signal sequence of a series of alter operation including the bottom of a key press, and mouse operation, Change into the signal sequence of a series of alter operation the character string of the number generated in said number generating section according to numbering directions by the alter operation signal generation section, and as an alter operation event It is characterized by having the control section (5) notified to the application process of a processing object through said window manager function.

[0007]

[Function] The number generator of this invention corresponds to the application process of the window it was [ the window ] open on the display screen. A keyboard or the alter operation from a mouse is distinguished directly above the cursor location on the display screen, and document processing system equipment equipped with the window manager function which notifies the alter operation event to the application process of relevance is equipped. [ this number generator / the section ] if the number generating section (3) makes serial generate the character string of a number using the data of a counter, the given sequence-of-numbers generating rule, and a sequence-of-numbers generating parameter The alter operation signal generation section (4) changes the contents of the operation processing which inputs the character string of the generated number into a directions position into the signal sequence of a series of alter operation including the bottom of a key press, and mouse operation. A control section (5) changes into the signal sequence of a series of alter operation the character string of the number generated in the number generating section according to numbering directions by the alter operation signal generation section, and notifies it to the application process of a processing object through said window manager function as an alter operation event. Thus, to each application process, it generates one by one and the character string of a number is supplied.

[0008] When performing a text editing in document processing system equipment and doing numbering work by this, based on required tbe data etc., the character string of a number can be generated automatically beforehand, and it can input one by one. For this reason, ********** of the manual labor in numbering work is lost, and an input mistake can be prevented. furthermore, [ the character string of the generated number ] as the same signal as the event generated by the alter operation of keyboard grabbing and mouse operation A number generating function can be used for any application processes as it is, without being dependent on a specific application process, since it is notified to the application process of a processing object through a window manager function. For this reason, the futility which overlaps and has a number creation function for every application process can be lost.

[0009]

[Working example] One work example of this invention is hereafter explained concretely with reference to Drawings. Drawing 1 is the block diagram showing the composition of the important section of the document processing system equipment with which the number listing device concerning one work example of this invention is incorporated. in drawing 1 -- 1 -- a window manager and 2 -- as for a counter and 3b, the number generating section and 3a of the format storage section and 3c are [ the alter operation signal generation section and 5 ] number generating functional control sections the number character generation section and 4 the application process of document processing systems, such as a document editor, and 3. Moreover, as for a mouse driver and 7, a display unit and 9 are keyboards a mouse and 8 6.

[0010] A window manager 1 is the input/output interface section which performs radial transfer using the display screen of De Dis press equipment 8. Judge the input signal from the alter operation sections, such as a keyboard 9 and a mouse 7, and the application process 2 of the correspondence which serves as an operation target from the position of an application process window is chosen. Control which sends the character string inputted through the position of the cursor of the display screen, the event of the depression of a key, and the conversion-of-kana-into-kanji processing section (included in the system as a front end processor) is performed.

[0011] [ the computing system using the technology generally called multi-window ] Classify the screen on a display device into the field called two or more windows, and it is made to correspond to each of two or more application processes performed simultaneously, and it is constituted so that two or more application processes can be simultaneously operated on one screen. The basic input/output interface section which offers the function which manages ******** in which application process and controls in the event generated by alter operation, such as a keyboard and a mouse, in that case is a window manager 1 here.

[0012] The application process 2 is a process which performs the application program which operates under management of a window manager 1 as one process of a computing system. Here, the document editor which performs word processing is started as an application process 2.

[0013] The number generating section 3 consists of a counter 3a, the format storage section 3b, and the number character generation section 3c. In response to the binary digit generated from Counter 3a, according to the predetermined form information memorized by the format storage section 3b, the number character generation section 3c performs the assembly of the character string of a number, and generates a number character one by one as a character string of a number from the numeric value and form information of a counter. For example, when Roman numerals are specified by form information, the number character string of Roman numerals is generated, and when a number with a circle is specified by form information, the number character string of a number with a circle is generated. Moreover, when the alphabet is specified by form information, the character string of A, B, C, and -- is generated one by one.

[0014] The alter operation signal generation section 4 is the processor section which compounds and outputs the event signal which generates the same signal as the event of alter operation, and generates each event signal added to the character string concerned to the character string generated in the number generation section 3. For example, the signal sequence of a series of alter operation events, such as an event of the moving operation of cursor required in order to insert the character string concerned into the document under edit, an event of a delete key depression, and an event of an insert key depression, is generated, and it adds to the character string concerned.

[0015] Moreover, the number generating functional control section 5 controls the number generating section 3 and the alter operation signal generator 4 according to directions of a user. By being the control section which supplies the character string of the generated number one by one, and registering with the **** window manager 1 to the application process 2 It is started by that a user performs a specific key stroke or directions of selection of a specific menu, and a number generating function becomes effective.

[0016] Next, operation concrete as an example is explained for operation of the work which reattaches a Section number for the following texts 1 like a text 2 working [ the application

process of a word processor (document editor) ].
Text 1Section2 xxxxxxx xx xxxx xxxxx.Section1 yyyy yyy yy y yyyyyy yy.Section3 zzz zzzz zzzzzz zzzzz zzz. text 2Section1 xxxxxxx xx xxxx xxxxx.Section2 yyyy yyy yy y yyyyyy yy.Section3 zzz zzzz zzzzzz zzzzz zzz. [0017] = Drawing 2 is the figure showing an example of the display screen in the document processing system equipment with which the number listing device of this example is incorporated. As for a character input / message subwindow, and 22, in drawing 2 , 20 is [ the 2nd application process window and 24 ] mouse cursors the 1st application process window and 23 the display screen and 21. The window manager has managed input/output operation, such as mouse cursor operation on the display screen 20, and a window display. Judge the input signal from the alter operation sections, such as a keyboard and a mouse, and the application process of the correspondence which serves as an operation target from the position on the display screen 20 of a mouse cursor 24 and the position of each application process windows 22 and 23 is chosen. Alter operation signals, such as position information of the cursor of the display screen and an event under a key press, are passed to an applicable application process.
[0018] Here, it sets in the 1st application process window 22. The word processor shall operate and the operation which reattaches the Section number of the above-mentioned text 1 in the text editing in this word processor using the number generating function by a number listing device shall be worked.
[0019] The explanatory view shown in drawing 3 and drawing 4 is a flow chart which explains the situation of change of a series of examples of operation which reattach a Section number in text editing processing, and the window screen in that case one by one. With reference to the flow chart of drawing 3 and drawing 4 , order is explained later on. In this case, first, in Step 31, if a user directs the clearance of a counter, the number generating functional control section 5 will control the number generation section 3 by operation of the "counter clearance" key **** registered, and will reset Counter 3a by it. Next, in Step 32, the character string "Section2" which is the number character string of the best sequence of a text 1 is chosen by mouse operation (mouse cursor movement and mouse button operation).
[0020] Next, in Step 33, the "number generation" key of a specific key is operated and generation of a number is directed. If generation of a number is directed, processing here will progress to Step 34 and the number generating functional control section 5 will start number generation processing. The number generating functional control section 5 starts the number generation section 3, and only 1 increases the value of Counter 3a. Next, according to the predetermined form information memorized by the format storage section 3b, from the value and form information of the counter, a number character string "Section1" here is generated and it outputs to the alter operation signal generation section 4. Next, the number generating functional control section 5 starts the alter operation signal generation section 4.

[0021] Thereby, in Step 34, the number generating section generates a character string "Section1", and the alter operation signal generation section generates two events of a "delete key depression" event and "character string insertion" event. Namely, [ the alter operation signal generation section 4 ] if a number character string "Section1" is inputted Generate two events of a "delete key depression" event and "character string insertion" event, and [ a "character string insertion" event ] The number character string "Section1" generated in the number generating section 3 as an argument is attached, and an event is given to a window manager 1 one by one through the number generating functional control section 5. These events are passed to the application process of the word processor which is the present running application process 2 in a window manager 1.

[0022] As a result, since the same event signal as the case where the user deleted the character string chosen by manual operation from the alter operation signal generator 4, and typing of the character string "Section1" is further carried out by a keyboard is generated and outputted, In the application process of a word processor, it operates like operation by a user's manual labor. That is, processing progresses to Step 35, the number character string "Section2" chosen by the "delete key depression" event is deleted, it progresses to the following step 36 further, and the character string "Section1" generated by the "character string insertion" event is inserted in this position here. Thereby, a character string called the number character string "Section2" chosen as a result replaces the character string "Section1."

[0023] Next, it progresses to Step 37 ( drawing 4 ), and the number character string of the 2nd line of the text 1 made into the following number "Section1" is chosen by mouse operation. And in the following step 38, the "number generation" key of a specific key is operated and generation of a number is directed. If generation of a number is directed, processing will progress to Step 39 here and the number generating functional control section 5 will start the number generation processing of the following number character string. By control of the number generating functional control section 5, only further 1 increases the value of Counter 3a, and according to predetermined form information, from the value and form information of the counter, the number generating section 3 generates the following number character string "Section2" here, and outputs to the alter operation signal generation section 4.

[0024] In the alter operation signal generation section 4, an input of a number character string "Section2" will generate two events of a "delete key depression" event and "character string insertion" event like last time. The number character string "Section2" generated in the number generating section 3 as an argument is attached to a "character string insertion" event, and a window manager 1 is given via the number generating functional control section 5. These events are passed to the application process of the word processor which is the present running application process 2 in a window manager 1.

[0025] In Step 39, the number generating section generates a character string "Section2", and this processing is performed, when the alter operation signal generation section generates two events of a "delete key depression" event and "character string insertion" event. By this [ an application process ] In the following step 40, the number character string "Section1" chosen by the "delete key depression" event is deleted, it progresses to the following step 41 further, and the character string "Section2" generated by the "character string insertion" event is inserted in this position. Thereby, in the application process of a word processor, it operates like the alter operation by a user's manual labor, and a character string called the number character string "Section1" chosen as a result replaces the character string "Section2."

[0026] thus -- in document processing system equipment here -- "-- by the control operation using the number generating functional control section 5 by an easy key stroke called operation of operation of" key, and a counter clear "number generation" key, a troublesome number attaches in a text editing and repair work can be done easily. [ sequential ] Next, a flow is explained for the signal of the alter operation event generated in connection with a key stroke here.

[0027] Drawing 5 is the figure showing the flow of the alter operation event in the usual alter operation, and drawing 6 is a figure explaining the flow of an event when number generation is specified. In the case of the usual alter operation, as shown in drawing 5 , the event of alter operation to the application process 2 is directly told to the application process 2 by the path 51 through a window manager 1 from a keyboard 9. however, [ the flow of the alter operation event in the case of using the number generating functional control section 5 here ] As shown in drawing 6 , the operation event by the specific key stroke (operation of operation of a key and ""number generation [ Count clear" ]" key) of a keyboard 9 is told to the number generating functional control section 5 by the path 61 through a window manager 1 from a keyboard 9. By this, it is started by the number generating functional control section 5, and [ the number generating functional control section 5 ] The generation section 3 from a number and the alter operation signal generator 4 are controlled, the same event signal as the alter operation by the keyboard and a mouse is generated, and the operation event is told by the application process 2 through a window manager 1 with a path 62.

[0028] [ in addition, the number generating functional control section 5 and the application process 2 of a word processor of offering a number generation function here ] As shown in drawing 5 and drawing 6 , it is combined through the window manager 1 and is not directly combined with the number generating functional control section 5 and the application process 2. Therefore, in not a word processor but other applications, for example, a spreadsheet, the application process 2 can use a number generating function here as it is. Moreover, also in the state where two or more application processes are started, each application process can operate the number generating functional control section 5, and can use this number generating function independently.

[0029] moreover -- setting in the number generating section 3, in order to avoid complexity in explanation of an above-mentioned work example and to make an understanding easy -- form information -- eye **** -- laws -- although **** format storage section 3b shall have memorized, a user may enable it to set up if needed arbitrarily Moreover, of course, it is possible for it to be able to constitute so that the number generated in the number generating section 3 may also compound character strings, such as not only Arabic figures but Roman numerals, an English character sequence sequence (a, b, c, --), a katakana character sequence sequence (I, RO, Ha, --), etc., and may be generated. Moreover, of course, some format may generate the character string same irrespective of the value of a counter. Next, other examples of composition of such the number generating section are explained.

[0030] Drawing 7 is the figure showing the program encoding example of the treatment module by the C program of other examples of composition of the number generating section. If the composition of the number generating section by this treatment module is explained briefly, in the C program shown in drawing 7 , Variable count is a counter, Variable format will be the format storage section and format will be memorized by Variable format. First, if initialization processing of Variable count is performed and function get_number is call(ed), processing to which the character string which %d put into the value of a counter among the character strings of format (data of Variable format), was changed, and was obtained is returned will be performed. That is, the character string "Section1" is generated at first in this case. Next, if function get_number is call(ed), the variable count of a counter will be incremented, %d will be put in and changed into the value of a counter among the character strings of format, and then the character string "Section2" will be generated.

[0031] By the way, you may constitute the form information of the above data of Variable format so that a format may be extracted from the given concrete character string. For example, by a specific key stroke, prepare the format analysis processing section, take in a format, and [ with the next instructing operation ] The character string chosen is read through a window manager 1, a series of digit strings of tone BE ****** and the beginning are extracted for every one character of the character string from a tail, the value is set to the counter variable count, and the character string which rewrote the portion to %d is set to Variable format. Or two or more format and pattern matching which were **** registered are performed, and you may make it choose format by the format analysis processing section equipped with the pattern-matching engine.

[0032] Thus, since the number character string in the pattern **** specified can be written in by an easy key stroke, the time and effort typed manually one by one can be saved, and the input error by a typing error does not arise. Moreover, this number generation function is not included in an individual application program as mentioned above. Since one number generation control section 5 is combined with the application process through the window manager 1, the futility that each application process (application program) has the same number generation function (program) is lost. Moreover, for a user, in every application process, since the function of numbering is offered by the same operation, inconvenient [ by each application process / that the operation must be memorized for every operation ] is cancelable.

[0033]

[Effect of the Invention] As mentioned above, as explained, when according to the number generator of this invention performing a text editing in document processing system equipment and doing numbering work, based on required tbe data etc., the character string of a number can be generated automatically beforehand, and it can input. For this reason, ********** of the manual labor in numbering work is lost, and an input mistake can be prevented. Moreover, since the character string of the generated number is notified to the application process of a processing object through a window manager function as the same signal as the event generated by the alter operation of keyboard grabbing and mouse operation without it is dependent on a specific application process -- how -- a number generating function can be used also for an application process as it is. For this reason, the futility which overlaps and has a number creation function for every application process can be lost.

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[Brief Description of the Drawings]

[Drawing 1] Drawing 1 is the block diagram showing the composition of the important section of the document processing system equipment with which the number listing device concerning one work example of this invention is incorporated,

[Drawing 2] Drawing 2 is the figure showing an example of the display screen in the document processing system equipment with which the number listing device of this example is incorporated,

[Drawing 3] Drawing 3 is the 1st flow chart which explains the situation of change of a series of examples of operation which reattach a Section number in text editing processing, and the window screen in that case one by one,

[Drawing 4] Drawing 4 is the 2nd flow chart following drawing 3 which explains the situation of change of a series of examples of operation which similarly reattach a Section number in text editing processing, and the window screen in that case one by one,

[Drawing 5] Drawing 5 is the figure showing the flow of the alter operation event in the usual alter operation,

[Drawing 6] Drawing 6 is a figure explaining the flow of an event when number generation is specified, [Drawing 7] Drawing 7 is the figure showing the program encoding example of the treatment module by the C program of other examples of composition of the number generating section.

[Explanations of letters or numerals]

1 -- A window manager, 2 -- An application process, 3 -- Number generating section, 3a [ -- Alter operation signal generation section, ] -- A counter, 3b -- The format storage section, 3c -- The number character generation section, 4 5 [ -- Display unit, ] -- A number generating functional control section, 6 -- A mouse driver, 7 -- A mouse, 8 9 -- a keyboard and 20 -- the display screen and 21 -- a character input / message subwindow, and 22 -- the -- The application process window of one, and 23 -- the -- The application process window of two, and 24 -- a mouse cursor.

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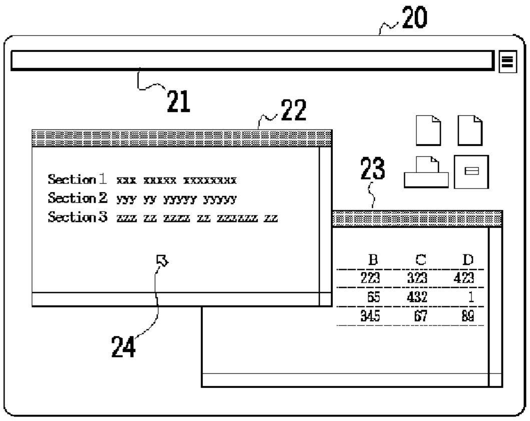
[Drawing 2]

図2

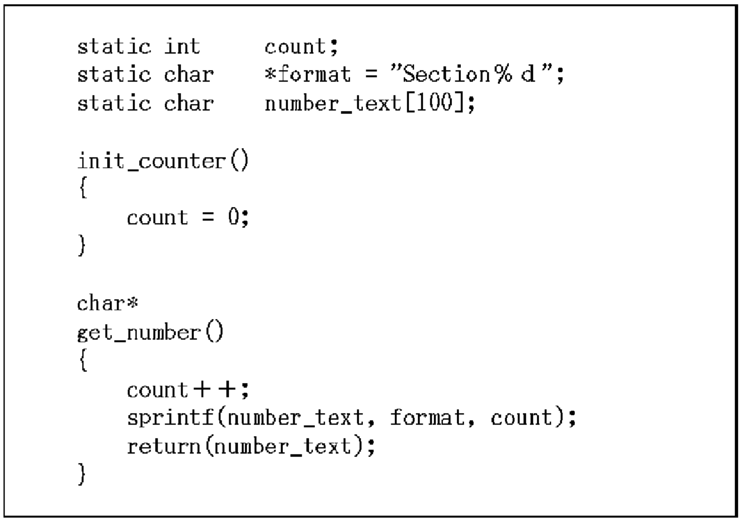


Section 1 xxx xxxxx xxxxxxxx
Section 2 yyy yy yyyyy yyyyy
Section 3 zzz zz zzzz zz zzzzzz zz

| B | C | D |
|---|---|---|
| 223 | 323 | 423 |
| 65 | 432 | 1 |
| 345 | 67 | 89 |

[Drawing 7]

図7



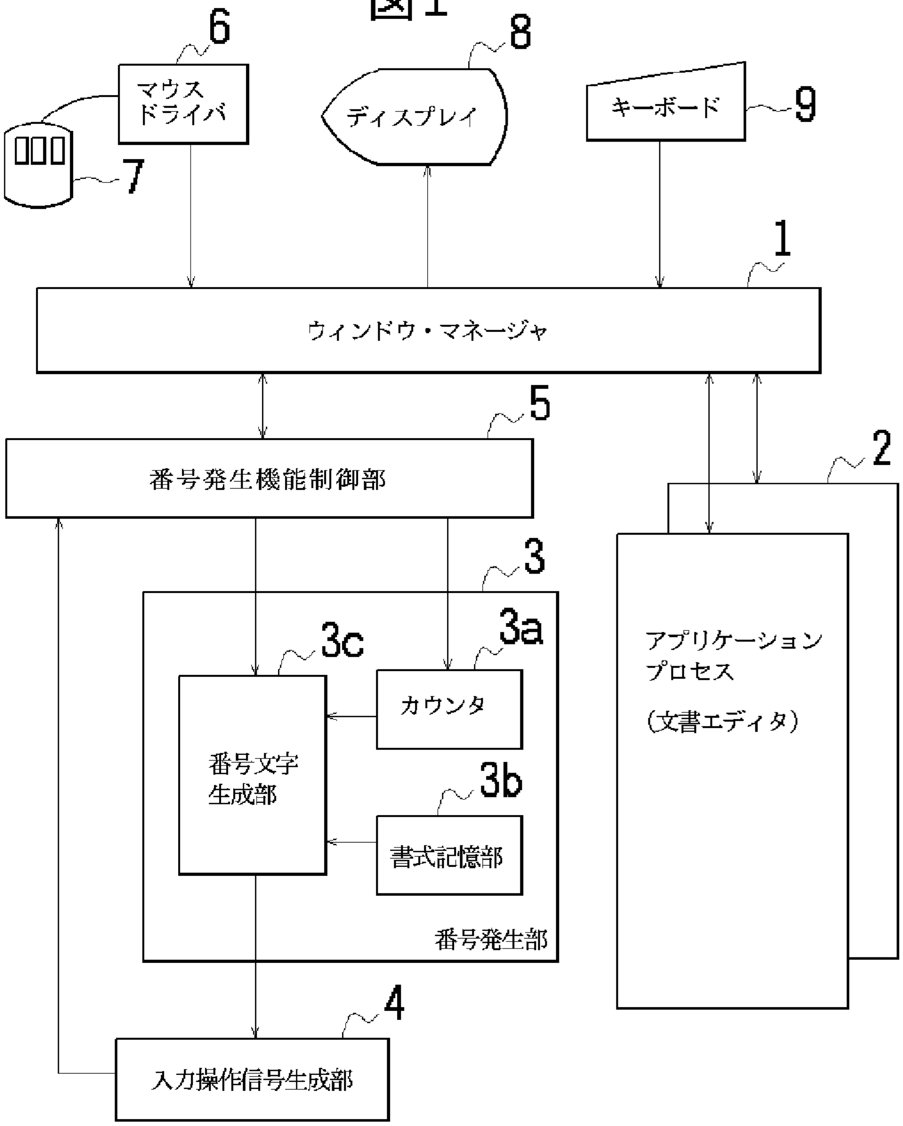
```
static int      count;
static char     *format = ”Section％ｄ”;
static char     number_text[100];

init_counter()
{
    count = 0;
}

char*
get_number()
{
    count＋＋;
    sprintf(number_text, format, count);
    return(number_text);
}
```

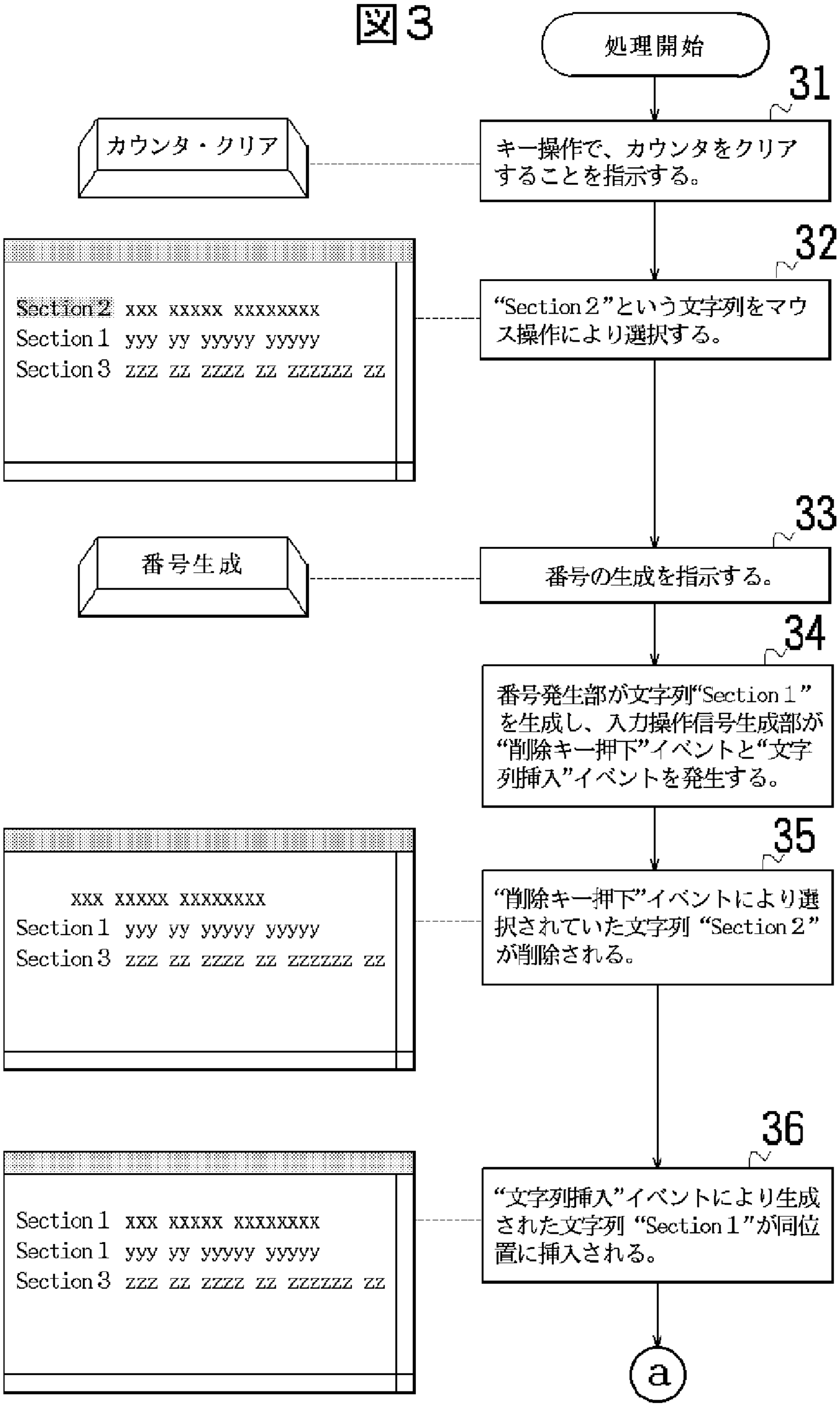
[Drawing 1]

図1


6
マウス
ドライバ
7
8
ディスプレイ
キーボード
9
1
ウィンドウ・マネージャ
5
番号発生機能制御部
2
3
3c
3a
カウンタ
番号文字
生成部
3b
書式記憶部
番号発生部
アプリケーション
プロセス
（文書エディタ）
4
入力操作信号生成部

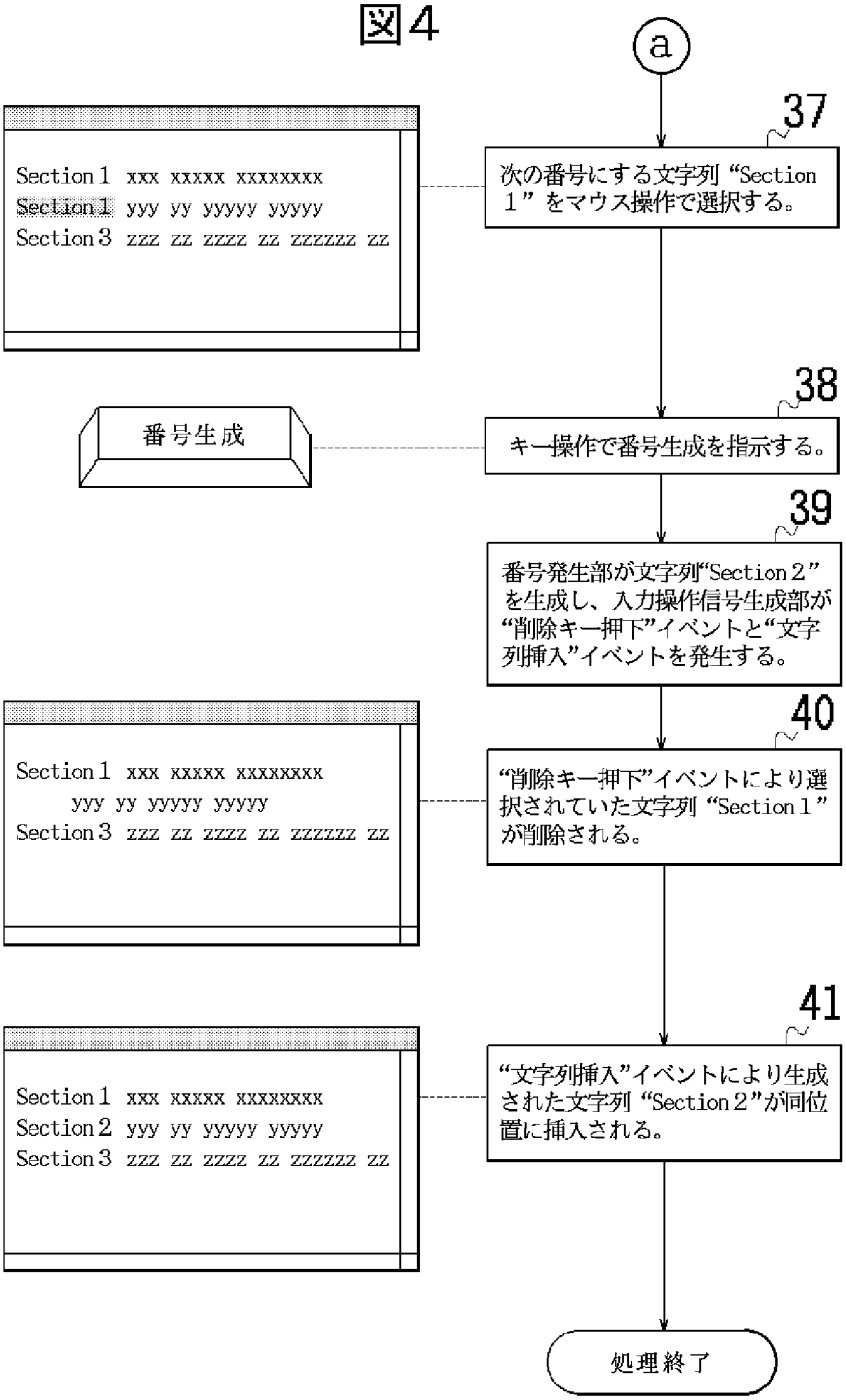
[Drawing 3]

図３


処理開始
31
カウンタ・クリア
キー操作で、カウンタをクリアすることを指示する。
32
Section 2 xxx xxxxx xxxxxxxx
Section 1 yyy yy yyyyy yyyyy
Section 3 zzz zz zzzz zz zzzzzz zz
"Section 2"という文字列をマウス操作により選択する。
33
番号生成
番号の生成を指示する。
34
番号発生部が文字列"Section 1"を生成し、入力操作信号生成部が"削除キー押下"イベントと"文字列挿入"イベントを発生する。
35
xxx xxxxx xxxxxxxx
Section 1 yyy yy yyyyy yyyyy
Section 3 zzz zz zzzz zz zzzzzz zz
"削除キー押下"イベントにより選択されていた文字列 "Section 2"が削除される。
36
Section 1 xxx xxxxx xxxxxxxx
Section 1 yyy yy yyyyy yyyyy
Section 3 zzz zz zzzz zz zzzzzz zz
"文字列挿入"イベントにより生成された文字列 "Section 1"が同位置に挿入される。
a

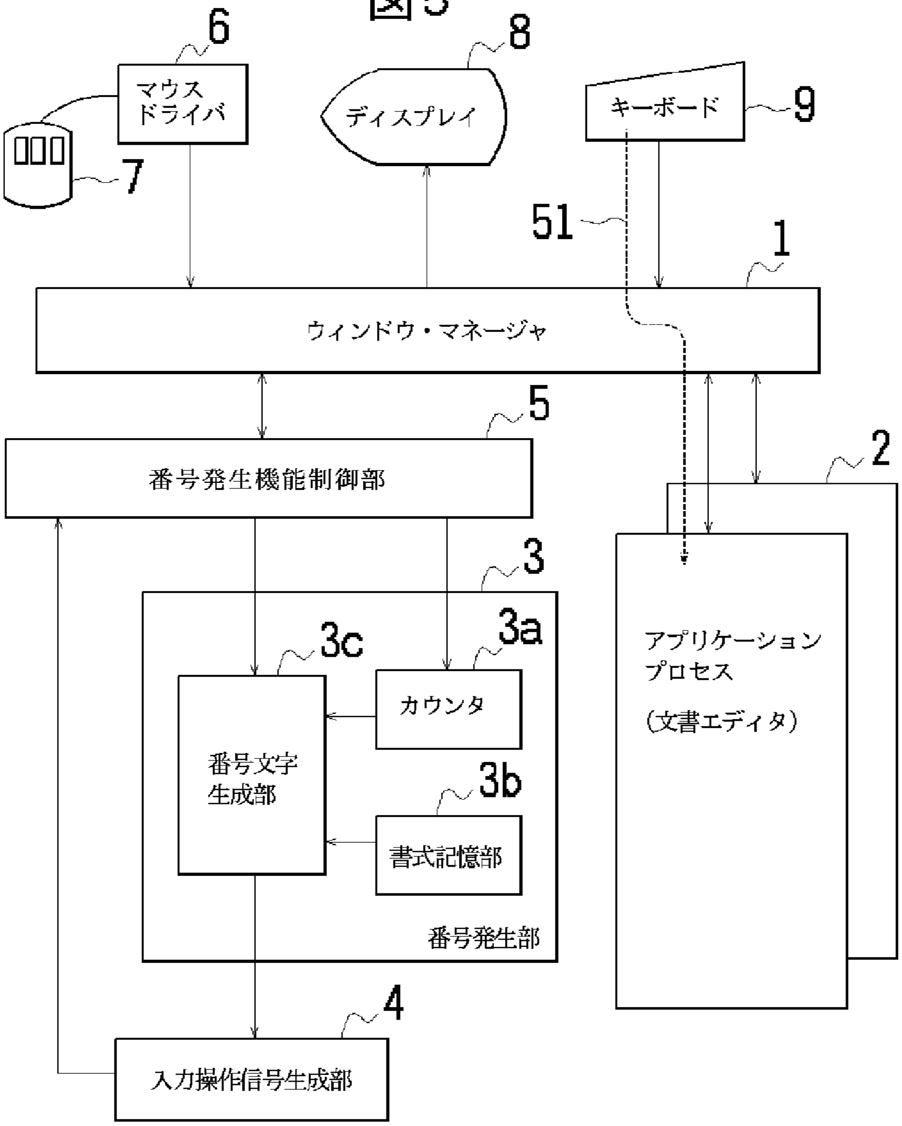
[Drawing 4]

図4


a
37
次の番号にする文字列 "Section 1" をマウス操作で選択する。
Section 1 xxx xxxxx xxxxxxxx
Section 1 yyy yy yyyyy yyyyy
Section 3 zzz zz zzzz zz zzzzzz zz
38
番号生成
キー操作で番号生成を指示する。
39
番号発生部が文字列"Section 2"を生成し、入力操作信号生成部が"削除キー押下"イベントと"文字列挿入"イベントを発生する。
40
"削除キー押下"イベントにより選択されていた文字列 "Section 1" が削除される。
Section 1 xxx xxxxx xxxxxxxx
yyy yy yyyyy yyyyy
Section 3 zzz zz zzzz zz zzzzzz zz
41
"文字列挿入"イベントにより生成された文字列 "Section 2"が同位置に挿入される。
Section 1 xxx xxxxx xxxxxxxx
Section 2 yyy yy yyyyy yyyyy
Section 3 zzz zz zzzz zz zzzzzz zz
処理終了

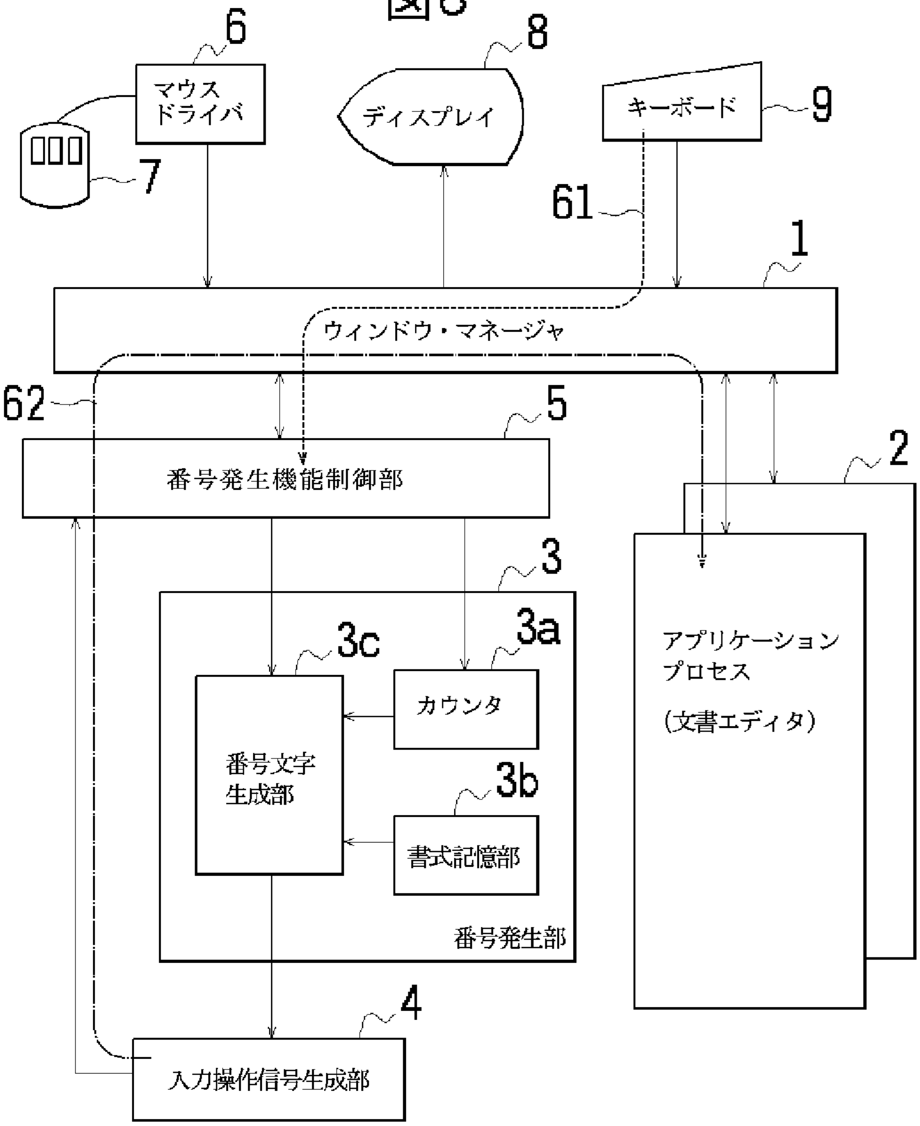
[Drawing 5]

図5


6
マウス
ドライバ
7
8
ディスプレイ
キーボード
9
51
1
ウィンドウ・マネージャ
5
番号発生機能制御部
2
3
3c
3a
カウンタ
番号文字
生成部
3b
書式記憶部
番号発生部
アプリケーション
プロセス
（文書エディタ）
4
入力操作信号生成部

[Drawing 6]

図6


6
マウス
ドライバ
7
8
ディスプレイ
キーボード
9
61
1
ウィンドウ・マネージャ
62
5
番号発生機能制御部
2
3
3c
3a
カウンタ
番号文字
生成部
3b
書式記憶部
番号発生部
アプリケーション
プロセス
（文書エディタ）
4
入力操作信号生成部

[Translation done.]